Morse Brothers, Inc.	**)**	**Departmental**
Androscoggin County	**)**	**Findings of Fact and Order**
Poland, Maine	**)**	**Air Emission License**
A-831-71-A-N	**)**	

After review of the air emissions license application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., Section 344 and Section 590, the Department finds the following facts:

I. REGISTRATION

A. Introduction

Morse Brothers, Inc. (Morse Bros.) of Poland, Maine has applied for an Air Emission License permitting the operation of emission sources associated with their bark mulch drying facility.

B. Emission Equipment

Morse Bros. is authorized to operate the following equipment:

Fuel Burning Equipment

Equipment	Maximum Capacity (MMBtu/hr)	Maximum Firing Rate	Fuel Type	Stack #
Burner	30.0	6,676 lb/hr (40% moisture)	Dried mulch fines (biomass)	1

Process Equipment

Equipment	Production Rate	Pollution Control Equipment	Stack #
Rotary Dryer	45,000 lb/hr	Settling Chamber High Efficiency Cyclone	1

C. Application Classification

The new source is considered a major source based on whether or not expected emissions exceed the "Significant Emission Levels" as given in Maine's Air Regulations. The emission for the new source are determined by the maximum future license allowed emissions, as follows:

Pollutant	**Max. Future License (TPY)**	**Sig. Level**
PM	46.0	100
PM_{10}	46.0	100
SO_2	3.3	100
NO_x	28.9	100
CO	78.8	100
VOC	5.0	50

This source is determined to be a minor new source and has been processed as such.

II. BEST PRACTICAL TREATMENT (BPT)

A. Introduction

In order to receive a license the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in Chapter 100 of the Air Regulations. Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

B. Process Equipment

Morse Bros. dries 60% moisture mulch to 40% moisture mulch. The wet mulch is fed into a variable speed rotary drum dryer where the moisture content is lowered to approximately 40%. A 30.0 MMBtu/hr burner combusting dried mulch fines provides heat to the dryer. Hot exhaust gases from the burner are drawn into the dryer with the mulch by means of an induced draft fan. The fluidized mixture of mulch and air exits the dryer and enters a settling chamber where the heavier product drops out. The gas stream then enters a high-efficiency cyclone where the smaller particles are removed. Exhaust gas from the cyclone then travels up Stack 1 while the mulch combines with that removed in the settling chamber and goes to a storage area.

C. Burner

The Burner is rated at 30.0 MMBtu/hr and vents through the dryer, exhausts to the settling chamber, through a high efficiency cyclone and then exhausts to atmosphere via Stack 1.

BACT for the Burner is the following:

- Emission limits for PM/PM_{10} were based on test data from similar units supplied by Morse Bros.
- SO_2 emission limits are based on an ultimate analysis of the mulch.
- NO_x, CO and VOC emission limits are based on the use of bark (40% moisture). Emission data was taken from AP-42 dated 7/01.
- Visible emissions from the stack serving the Burner (Stack 1) shall not exceed 20% opacity on a six (6) minute block average basis.

D. Rotary Drum Dryer

The Rotary Drum Dryer processes 45,000 lb/hr of wet mulch (60% moisture) and the exhaust gas vents to the settling chamber, through a high efficiency cyclone and exhausts to atmosphere via Stack 1. Mulch with a moisture content of approximately 40% exits the dryer.

BACT for the Rotary Drum Dryer is the following:

- Use of a settling chamber.
- Use of a high efficiency cyclone.
- Emission limits for PM/PM_{10} were based on test data from similar units supplied by Morse Bros.
- Visible emissions from the stack serving the Rotary Drum Dryer (Stack 1) shall not exceed 20% opacity on a six (6) minute block average basis, except for no more than 2 six minute block averages in a 3 hour period.

E. Fugitive Emissions

Potential sources of fugitive PM emissions, including material stockpiles and unpaved roadways, shall be controlled by wetting with water, with calcium chloride, or other methods as approved by the Bureau of Air Quality to prevent visible emissions in excess of 10% opacity, based on a 3 minute block average.

F. Annual Emissions

Morse Bros. has the following annual emissions based on operating 8,760 hours per year:

- 26,239 tons per year of mulch (40% moisture), or equivalent, in the Burner

(12 month rolling total)

Total Allowable Annual Emission for the Facility
(used to calculate the annual license fee)

Pollutant	Tons/Year
PM	46.0
PM_{10}	46.0
SO_2	3.3
NO_x	28.9
CO	78.8
VOC	5.0

III. AMBIENT AIR QUALITY ANALYSIS

A. Overview

A combination of screening and refined modeling was performed to show that Morse Brothers' emissions, in conjunction with other sources, would not cause or contribute to violations of Maine Ambient Air Quality Standards (MAAQS) for Sulfur Dioxide (SO_2), Particulate Matter (PM_{10}), Nitrogen Dioxide (NO_2), and Carbon Monoxide (CO) and does not exceed maximum allowable Class II increments for SO_2, PM_{10}, and NO_2.

It was determined by MEDEP-BAQ that Morse Brothers does consume SO_2, PM_{10}, and NO_2 increment, therefore a Class II increment analysis was performed. Morse Brothers is a new minor source located approximately 79 kilometers from the nearest Class I area. MEDEP-BAQ determined that Morse Brothers is not likely to affect ambient Class I increment or visibility, therefore a Class I analysis was not performed.

B. Model Inputs

The SCREEN3 model was used in all terrain to determine the worst-case operating load and the SO_2, PM_{10}, NO_2, and CO significant impact areas, standards and increment. Since Morse Brothers' stack height is less than full GEP height, a cavity analysis was performed in SCREEN3 using the Schulman-Scire algorithms for a stack not attached to a structure.

The ISC-PRIME model in refined simple terrain mode was only used to determine compliance with increment for PM_{10} in simple terrain and in the cavity region.

All modeling was performed in accordance with all applicable requirements of the Maine Department of Environmental Protection, Bureau of Air Quality (MEDEP-BAQ) and the United States Environmental Protection Agency (USEPA).

A valid 5-year hourly meteorological off-site database was used for the refined modeling. The wind data was collected at a height of 15 meters at the Auburn

Airport DEP meteorological site during the 5-year period 1987 and 1990-1993. Missing data were interpolated or coded as missing. Portland National Weather Service (NWS) surface temperature data was used. Hourly cloud cover, ceiling height and surface wind speed data also from Portland NWS were used to calculate stability. Hourly mixing heights were derived from NWS surface and upper air data.

Stack parameters used in the modeling for Morse Brothers are listed in Table IV-1.

TABLE IV-1. Stack Parameters

Facility/stack	Stack Base Elevation (m)	Stack Height (m)	GEP Stack Ht. (m)	Stack Diameter (m)	UTM E (km)	UTM N (km)
CURRENT/PROPOSED:						
Morse Brothers						
Dryer Stack	73.15	17.07	18.29	0.91	395.950	4878.680

Emission parameters for Morse Brothers used in demonstrating compliance with MAAQS are listed in Table IV-2. For the purpose of determining PM_{10} and NO_2 impacts, all PM and NO_x emissions were conservatively assumed to convert to PM_{10} and NO_2 respectively.

TABLE IV-2. Emission Parameters

Facility/stack	Operating Scenario	SO_2 (g/s)	PM_{10} (g/s)	NO_2 (g/s)	CO (g/s)	Temp (°K)	Stack Vel. (m/s)
CURRENT/PROPOSED:							
Morse Brothers							
Dryer Stack	Maximum	0.1	1.10	0.83	2.27	450.00	7.72

C. Applicant's modeled impacts

SCREEN3 modeling analyses were performed for the maximum (100%), typical (75% of maximum operating case emission and stack velocity), and minimum (50% of maximum operating case emission and stack velocity) operating load cases for Morse Brothers alone. It was demonstrated that the maximum operating load case would result in maximum impacts in simple, intermediate, and complex terrain; thus the typical and minimum load cases were not examined further. The SCREEN3 model results for Morse Brothers are shown in Table IV-3. Impacts that exceed their significance levels are indicated in bold type.

TABLE IV-3. Maximum SCREEN3 Predicted Impacts from Morse Brothers Alone

Pollutant	Averaging Period	Maximum Impact Simple Terrain ($\mu g/m^3$)	Maximum Impact Intermediate and Complex Terrain ($\mu g/m^3$)	Class II Significance Level ($\mu g/m^3$)
SO_2	3-hour	7.94	2.48	**25**
	24-hour	3.53	1.10	**5**
	Annual	0.71	0.22	**1**
PM_{10}	24-hour	**40.30**	**12.57**	**5**
	Annual	**8.06**	**2.51**	**1**
NO_2	Annual	**6.12**	**1.91**	**1**
CO	1-hour	208.48	65.03	**2000**
	8-hour	145.93	45.52	**500**

A cavity analysis was performed in SCREEN3 to determine if Maine Ambient Air Quality Standards (MAAQS) would be met. It was demonstrated that Morse Brothers' impacts meet standards for all pollutant averaging periods. The results are shown in Table IV-4.

TABLE IV-4. Maximum SCREEN3 Cavity Analysis for Morse Brothers

Pollutant	Averaging Period	Maximum Impact Cavity Region ($\mu g/m^3$)	MAAQS ($\mu g/m^3$)
SO_2	3-hour	3.08	**1150**
	24-hour	1.37	**230**
	Annual	0.27	**57**
PM_{10}	24-hour	15.64	**150**
	Annual	3.13	**40**
NO_2	Annual	2.37	**100**
CO	1-hour	80.92	**40,000**
	8-hour	56.65	**10,000**

D. Combined Source Modeling

Because modeled impacts from Morse Brothers were greater than significance levels for all PM_{10}, and NO_2 averaging periods in simple and intermediate and complex terrain, other sources not explicitly included in the modeling analysis must be included by using representative background concentrations for the area. Background concentrations used were based on conservative central Maine rural background monitoring data from data collected for PM_{10} from data collected from the Jay (Crash Road) site, and for data collected for NO_2 from the Portland area (TLSP site in Cape Elizabeth). These background values are listed in Table IV-5.

TABLE IV-5. Background Concentrations (µg/m^3)

Pollutant	Averaging Period	Background
PM_{10}	24-hour	47
	Annual	14
NO_2	Annual	11

MEDEP-BAQ examined other sources whose impacts would potentially be significant in or near Morse Brothers significant impact area. Due to the applicant's location, extent of the significant impact area, results from past modeling analyses done for nearby sources and nearby source emissions, MEDEP-BAQ has determined that no other sources would be required for combined source modeling.

Table IV-6 summarizes the maximum SCREEN3 combined source impacts. The predicted impacts were added to conservative background concentrations to demonstrate compliance with MAAQS. All combined source PM_{10}, and NO_2 averaging period impacts from Morse Brothers were below the respective MAAQS.

TABLE IV-6 Maximum SCREEN3 Combined Source Impacts in Simple and Complex Terrain

Pollutant	Averaging Period	Maximum Impact Simple Terrain (µg/m^3)	Maximum Impact Intermediate and Complex Terrain (µg/m^3)	Background (µg/m^3)	Maximum Total Impact (µg/m^3)	MAAQS (µg/m^3)
PM_{10}	24-hour	40.30	12.57	47	87.30	**150**
	Annual	8.06	2.51	14	22.06	**40**
NO_2	Annual	6.12	1.91	11	17.12	**100**

E. Class II Increment

Morse Brothers' emissions are totally increment consuming, therefore SCREEN3 was used to demonstrate that SO_2, PM_{10} and NO_2 increments would not be violated by Morse Brothers alone. Due to Morse Brothers location, extent of the significant impact area and nearby source's emissions, it has been determined that no other sources would be required for combined source increment modeling. Table IV-7 summarizes Class II increment consumption in simple and intermediate and complex terrain for Morse Brothers alone. Impacts that exceed the maximum allowable Class II increment levels are indicated in bold type.

TABLE IV-7 Maximum SCREEN3 Class II Increment in All Terrain

Pollutant	Averaging Period	Maximum Impact Simple Terrain ($\mu g/m^3$)	Maximum Impact Complex Terrain ($\mu g/m^3$)	Class II Increment ($\mu g/m^3$)
SO_2	3-hour	7.94	2.48	**512**
	24-hour	3.53	1.10	**91**
	Annual	0.71	0.22	**20**
PM_{10}	24-hour	**40.30**	12.57	**30**
	Annual	8.06	2.51	**17**
NO_2	Annual	6.12	1.91	**25**

Since screening modeling results exceed the PM_{10} 24-hour increment in simple terrain, ISC-PRIME was used to demonstrate that Morse Brothers would not violate PM_{10} increments. Table IV-8 summarizes PM_{10} Class II increment consumption in simple terrain for Morse Brothers.

TABLE IV-8 Maximum ISC-PRIME Class II Increment in Simple Terrain

Pollutant	Averaging Period	Maximum Impact ISC-PRIME ($\mu g/m^3$)	UTM E (km)	UTM N (km)	Class II Increment ($\mu g/m^3$)
PM_{10}	24-hour	19.79	395.850	4879.150	**30**
	Annual	2.82	395.850	4879.150	**17**

Class II increment analyses require inclusion of Area Source and Mobile Source NO_x emissions.

Area Source Growth

Population growth in Androscoggin County can be used as a surrogate factor for the growth in the emissions from residential combustion sources. Information from the U.S. Census Bureau estimates that the population in Androscoggin County was 105,350 in 1990 and 101,337 in 1999 for a net decrease of 3.8% between 1990 and 1999. Because of lack of growth in area source emissions, a detailed analysis of area source emissions of NO_x was not required.

Mobile Source Growth

Growth in vehicle miles traveled (VMT) can be used to determine the growth in NO_x emissions in the impact area of the proposed source. MEDEP-BAQ performed motor vehicle emission model runs for the period of 1987 to 1998. A VMT growth for this same period of 15.9% for Androscoggin County combined with known controls in mobile source NO_x emissions causes insignificant growth of NO_x in this time period. Hence, further detailed analysis of mobile NO_x emissions are not needed.

As a result, MEDEP-BAQ determined that insignificant NO_2 increment has been consumed by mobile and area sources in Androscoggin County. Thus, only point sources need to be considered in the increment analysis.

F. Summary

In summary, it has been demonstrated that Morse Brothers in its proposed configuration will not cause or contribute to a violation of any SO_2, PM_{10}, NO_2, and CO averaging period MAAQS or exceed maximum allowable Class II increment.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-831-71-A-N, subject to the following conditions:

(1) Employees and authorized representatives of the Department shall be allowed access to the licensee's premises during business hours, or any time during which any emissions units are in operation, and at such other times as the Department deems necessary for the purpose of performing tests, collecting samples, conducting inspections, or examining and copying records relating to emissions. (Title 38 MRSA §347-C)

(2) The licensee shall acquire a new or amended air emission license prior to commencing construction of a modification, unless specifically provided for in Chapter 115.

(3) Approval to construct shall become invalid if the source has not commenced construction within eighteen (18) months after receipt of such approval or if construction is discontinued for a period of eighteen (18) months or more. The Department may extend this time period upon a satisfactory showing that an extension is justified, but may condition such extension upon a review of either the control technology analysis or the ambient air quality standards analysis, or both.

(4) The licensee shall establish and maintain a continuing program of best management practices for suppression of fugitive particulate matter during any period of construction, reconstruction, or operation which may result in fugitive

dust, and shall submit a description of the program to the Department upon request.

(5) The licensee shall pay the annual air emission license fee to the Department, calculated pursuant to Title 38 M.R.S.A. § 353.

(6) The license does not convey any property rights of any sort, or any exclusive privilege.

(7) The licensee shall maintain and operate all emission units and air pollution systems required by the air emission license in a manner consistent with good air pollution control practice for minimizing emissions.

(8) The licensee shall maintain sufficient records to accurately document compliance with emission standards and license conditions and shall maintain such records for a minimum of six (6) years. The records shall be submitted to the Department upon written request.

(9) The licensee shall comply with all terms and conditions of the air emission license. The filing of an appeal by the licensee, the notification of planned changes or anticipated noncompliance by the licensee, or the filing of an application by the licensee for a renewal of a license or amendment shall not stay any condition of the license.

(10) The licensee may not use as a defense in an enforcement action that the disruption, cessation, or reduction of licensed operations would have been necessary in order to maintain compliance with the conditions of the air emission license.

(11) In accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department, the licensee shall:

(i) perform stack testing to demonstrate compliance with the applicable emission standards under circumstances representative of the facility's normal process and operating conditions:

a. within sixty (60) calendar days of receipt of a notification to test from the Department or EPA, if visible emissions, equipment operating parameters, staff inspection, air monitoring or other cause indicate to the Department that equipment may be operating out of compliance with emission standards or license conditions; or

b. pursuant to any other requirement of this license to perform stack testing.

(ii) install or make provisions to install test ports that meet the criteria of 40 CFR Part 60, Appendix A, and test platforms, if necessary, and other accommodations necessary to allow emission testing; and

(iii) submit a written report to the Department within thirty (30) days from date of test completion.

(12) If the results of a stack test performed under circumstances representative of the facility's normal process and operating conditions indicate emissions in excess of the applicable standards, then:

(i) within thirty (30) days following receipt of such test results, the licensee shall re-test the non-complying emission source under circumstances representative of the facility's normal process and operating conditions and in accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department; and

(ii) the days of violation shall be presumed to include the date of stack test and each and every day of operation thereafter until compliance is demonstrated under normal and representative process and operating conditions, except to the extent that the facility can prove to the satisfaction of the Department that there were intervening days during which no violation occurred or that the violation was not continuing in nature; and

(iii) the licensee may, upon the approval of the Department following the successful demonstration of compliance at alternative load conditions, operate under such alternative load conditions on an interim basis prior to a demonstration of compliance under normal and representative process and operating conditions.

(13) Notwithstanding any other provisions in the State Implementation Plan approved by the EPA or Section 114(a) of the CAA, any credible evidence may be used for the purpose of establishing whether a person has violated or is in violation of any statute, regulation, or Part 70 license requirement.

(14) The licensee shall maintain records of malfunctions, failures, downtime, and any other similar change in operation of air pollution control systems or the emissions unit itself that would affect emission and that is not consistent with the terms and conditions of the air emission license. The licensee shall notify the Department within two (2) days or the next state working day, whichever is later, of such occasions where such changes result in an increase of emissions. The licensee shall report all excess emissions in the units of the applicable emission limitation.

(15) Upon written request from the Department, the licensee shall establish and maintain such records, make such reports, install, use and maintain such monitoring equipment, sample such emissions (in accordance with such methods,

at such locations, at such intervals, and in such a manner as the Department shall prescribe), and provide other information as the Department may reasonably require to determine the licensee's compliance status.

(16) Drying Process

A. Fuel use records for the Burner shall be maintained on a monthly basis, in addition to the 12 month rolling total.

B. Emissions from the Burner and Rotary Drum Dryer shall vent through a settling chamber and a high efficiency cyclone prior to being exhausted through Stack #1.

C. Stack #1 (Burner and Dryer stack) shall be a minimum of 56.0 feet above ground level.

D. Emissions from the Burner and Rotary Drum Dryer section shall not exceed the following:

Pollutant	lb/MMBtu	lb/hr
PM*	0.29	8.76
PM_{10}	n/a	8.76
SO_2	n/a	0.76
NO_X	n/a	6.60
CO	n/a	18.00
VOC	n/a	1.14

*NOTE: 8.76 lb/hr is the combined rate from the Burner and Rotary Drum Dryer out Stack #1.

E. Visible Emissions

Stack 1 opacity shall not exceed 20% on a 6 minute block average, except for no more than 2 six minute block averages in a 3 hour period.

(17) Potential sources of fugitive PM emissions, including material stockpiles and roadways, shall be controlled by wetting with water, with calcium chloride, or other methods as approved by the Bureau of Air Quality to prevent visible emissions in excess of 10% opacity, based on a 3 minute block average.

(18) Morse Bros. shall notify the Department within 48 hours and submit a report to the Department on a quarterly basis if a malfunction or breakdown in any component causes a violation of any emission standard (Title 38 MRSA §605-C).

(19) **Annual Emission Statement**
In accordance with MEDEP Chapter 137, the licensee shall annually report to the Department, by **September 1**, the information necessary to accurately update the State's emission inventory by means of:

1) A computer program and accompanying instructions supplied by the Department;

   or

2) A written emission statement containing the information required in MEDEP Chapter 137.

Reports and questions should be directed to:

Attn: Criteria Emission Inventory Coordinator
Maine DEP
Bureau of Air Quality
17 State House Station
Augusta, ME 04333-0017
Phone: (207) 287-2437

(20) Morse Bros. shall pay the annual air emission license fee within 30 days of **December 30th** of each year. Pursuant to 38 MRSA §353-A, failure to pay this annual fee in the stated timeframe is sufficient grounds for revocation of the license under 38 MRSA §341-D, subsection 3.

(21) The term of this Order shall be for five (5) years from the signature below.

DONE AND DATED IN AUGUSTA, MAINE THIS DAY OF 2003.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:_____
BROOKE E. BARNES, ACTING COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: June 11, 2002
Date of application acceptance: June 11, 2002

Date filed with the Board of Environmental Protection: _____

This Order prepared by Mark E. Roberts, Bureau of Air Quality